Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A constant rate waterpouring system for use in an orthogonal frequency division multiplexing (OFDM) system with a multiple-input, multiple-output (MIMO) transmitter, comprising:

an encoding decision subsystem configured to select a constellation combination based on gains in channels of said MIMO transmitter;

a vector modulator subsystem, coupled to said encoding decision subsystem, configured to modulate a fixed number of bits in a bitstream with said constellation combination to generate a symbol vector; and

a normalization and precoding subsystem, coupled to said vector modulator subsystem, configured to weight said symbol vector in the frequency domain based on said gains to yield a weighted symbol vector and distribute said weighted symbol vector among said channels, wherein said system does not rely on feedback.

2. (Original) The waterpouring system as recited in Claim 1 wherein said encoding decision subsystem is configured to select said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

3. (Original) The waterpouring system as recited in Claim 1 wherein said gains are configured to be reflected in an ordered, real diagonal matrix.

4. (Original) The waterpouring system as recited in Claim 1 wherein said encoding decision subsystem is configured to select a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

5. (Original) The waterpouring system as recited in Claim 1 wherein said weighted symbol vector is configured to have an energy equaling a total transmit energy of said MIMO transmitter.

6. (Original) The waterpouring system as recited in Claim 1 wherein said normalization and precoding subsystem is configured to distribute said weighted symbol vector along an orthogonal right singular vector of a matrix representing said channels.

7. (Previously Presented) The waterpouring system as recited in Claim 1 wherein said MIMO transmitter is configured to form a part of a selected one of:

a narrowband wireless communication system employing multiple antennas, a broadband communication system employing orthogonal frequency division multiplexing, and

a multiuser communication system.

8. (Currently Amended) A constant rate waterpouring method for a multiple-input, multiple-output (MIMO) transmitter in an orthogonal frequency division multiplexing (OFDM) system, comprising:

selecting a constellation combination based on gains in channels of said MIMO transmitter;

modulating a fixed number of bits in a bitstream with said constellation combination to generate a symbol vector;

weighting said symbol vector in the frequency domain based on said gains to yield a weighted symbol vector, and

distributing said weighted symbol vector among said channels, wherein said method does not rely on feedback.

9. (Original) The method as recited in Claim 8 wherein said selecting comprises selecting said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

10. (Original) The method as recited in Claim 8 wherein said gains are reflected in an ordered, real diagonal matrix.

11. (Original) The method as recited in Claim 8 wherein said selecting comprises selecting a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

12. (Original) The method as recited in Claim 8 wherein said weighted symbol vector has an energy equaling a total transmit energy of said MIMO transmitter.

13. (Original) The method as recited in Claim 8 wherein said distributing comprises distributing said weighted symbol vector along an orthogonal right singular vector of a matrix representing said channels.

14. (Previously Presented) The method as recited in Claim 8 wherein said MIMO transmitter forms a part of a selected one of:

a narrowband wireless communication system employing multiple antennas,

a broadband communication system employing orthogonal frequency division multiplexing, and

a multiuser communication system.

15. (Currently Amended) A multiple-input, multiple-output (MIMO) transmitter in an orthogonal frequency division multiplexing (OFDM) system employing an input bitstream, comprising:

a plurality of transmit channels; and

a constant rate waterpouring system, including:

an encoding decision subsystem that selects a constellation combination based on gains in said transmit channels, a vector modulator subsystem, coupled to said encoding decision subsystem, that modulates a fixed number of bits in said input bitstream with said constellation combination to generate a symbol vector, and

a normalization and precoding subsystem, coupled to said vector modulator subsystem, that weights said symbol vector in the frequency domain based on said gains to yield a weighted symbol vector and distributes said weighted symbol vector among said transmit channels, wherein the system does not rely on feedback.

16. (Original) The MIMO transmitter as recited in Claim 15 wherein said encoding decision subsystem selects said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

17. (Original) The MIMO transmitter as recited in Claim 15 wherein said gains are reflected in an ordered, real diagonal matrix.

18. (Original) The MIMO transmitter as recited in Claim 15 wherein said encoding decision subsystem selects a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

19. (Original) The MIMO transmitter as recited in Claim 15 wherein said weighted symbol vector has an energy equaling a total transmit energy of said MIMO transmitter.

20. (Original) The MIMO transmitter as recited in Claim 15 wherein said normalization and precoding subsystem distributes said weighted symbol vector along an orthogonal right singular vector of a matrix representing said transmit channels.

21. (Cancelled).

22. (Cancelled).